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ABSTRACT

To determine if short concept films (SCF) are effective tools for assessing the potential of handicapped students for training and work, 135 students at a rehabilitation center were studied. Instructions for how to perform two jobs in jewelry engraving were given verbally by an evaluator, by a color-sound film, a color no-sound film, and by black and white sound and no-sound films. The five treatments were alternated weekly until a total of 27 students were exposed to each treatment. Results revealed the following: the SCF had little effect on the total time students spent on the job sample; instructional time was reduced by as much as two thirds when films were used; more instructional time was spent with students when they used the no-sound films; black and white no-sound films required the greatest number of repeated instructions; and color-sound films were judged most effective of the films. (Author/RJ)

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AN INVESTIGATION TO DETERMINE THE EFFECTIVENESS OF SHORT CONCEPT FILMS IN THE INSTRUCTION OF HANDICAPPED STUDENTS

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August 1969

Department of Health, Education, and Welfare

U.S. Office of Education
Bureau of Education for the Handicapped

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STUDY SUMMARY

The purpose of this study was to determine if short concept films (SCF) are effective evaluator tools for assessing handicapped students' potential for training and work. Another objective was to determine which of four types of SCF was most effective.

The rationale for the study rests upon the assumption that a reduction in the amount of time required for job sample instruction would be materially reduced by utilization of SCF. It was hypothesized that this procedure would provide the opportunity for the evaluator to more adequately meet the needs of all his students.

The sample population consisted of 135 handicapped students at the Georgia Rehabilitation Center. Instructions concerning two job samples to be completed on a jeweler's engraving machine were given by an evaluator using a verbal-without-film method, by a color-sound film, a color-no-sound film, a black and white-sound film and a black and white-no-sound film. The five treatments were alternated weekly until a total of 27 students were exposed to each treatment. Measurements were made to test hypotheses concerning: (a) total time on the tasks; (b) evaluator's instructional and noninstructional time with students; (c) number of times instructions were repeated; (d) number of times a particular type of film needed to be viewed to complete the job sample; and (e) the number and quality of engraving plates used.

Major findings of the study are as follows:

1. The SCF had little effect on the total time students spent on the job sample.
2. Instructional time can be reduced by as much as two-thirds when SCF are used.
3. More instructional time, operationally defined as time the evaluator spent with the student in a loosely structured interview upon completion of the job sample, was spent with students when they used the no-sound films, and, on the second job sample, when they were given the verbal-without-film instructions. However, the instructional time saved by using SCF could be used, at the option of the evaluator, as noninstructional time to enchance the evaluator-student interpersonal relationship.
4. The black and white-no-sound film treatments required the greatest number of repeated instructions. However, because the number of times instructions were repeated averaged well under one time per student, the use of standard instructions based on job sample analyses could have had an effect on this variable.
5. Color-sound was judged to be the most effective film treatment and the no-sound films the least effective for both the total number of film runs required and engraving plate quality. The mean differences were small however, and the overall study findings indicate that filmed instructions are as effective as completely verbal methods for presenting job sample instructions.

In summary, the study findings indicate that SCF are effective evaluator instructional tools and it is suggested that they might well prove to be valuable aids, not only in evaluation of potential, but in the training process as well.

CHAPTER I

INTRODUCTION

The Extent of Disability in America

Reliable estimates indicate that approximately 450,000 people become disabled due to injury or chronic illness each year in the United States (McGowan and Porter, 1967, p.14). Disease, occupational accidents, home and highway accidents, mental illness and mental retardation, as well as social disabilities stemming from cultural deprivation and poverty all contribute to the depletion of a precious American resource--manpower.

Senator Robert Dole (1969) of Kansas, speaking for innovations in programs designed to aid the handicapped, presented some sobering statistics concerning the extent of disability in this country. In his speech before the Senate on April 14, 1969, he pointed out that there are approximately 42 million physically handicapped persons in our country, and that of these ". . . only one third of . . . the blind and less than half of the paraplegics of working age are employed, while only a handful of about 200,000 persons with cerebral palsy who are of working age are employed." Senator Dole reported that the Department of Health, Education, and Welfare estimates there are at least 5 million physically disabled persons in this country who may be eligible for assistance related to restoring them to the world of work. Add to these the thousands of culturally deprived and poverty stricken who, because of their deprivation are unable to effectively compete in a modern, industrial society, and the enormity of the problem of lost manpower begins to unfold.

Obermann (1965, p.23) states, "Work is a basic ingredient in our culture. Most people organize their lives about their occupations. Grave disturbances result for the individual when, for any reason, he is barred from participation in this most important social activity."

Why Rehabilitate?

There are many arguments for the rehabilitation of the handicapped individual. The employed handicapped person becomes a taxpayer rather than a tax consumer and thus adds to the national income. Employment of the handicapped in suitable jobs increases the dignity and feeling of worth of the individual. In our country it is also believed that rehabilitation of the handicapped person is a humanitarian endeavor which, according to McGowan and Porter (1967, p.4), involves two basic assumptions: first, every member of our society has a basic right to the opportunity to earn a living; and second, society has an obligation to the handicapped individual to provide him the special services needed to equalize, as much as possible, occupational opportunities commonly possessed by the non-handicapped members of society.

For more than 48 years State-Federal vocational rehabilitation programs have sought to fulfill this societal obligation to the handicapped of this country. In this period more than 2,300,000 handicapped people have been

provided rehabilitation services and restored to more productive, useful lives.

The coordination of the State-Federal rehabilitation programs is the responsibility of the Rehabilitation Services Administration (RSA), an operating agency of the Social and Rehabilitation Service of the United States Department of Health, Education and Welfare. The specific objective of the RSA is to assist in providing handicapped people the help, skills, and incentives they need to become self reliant and self-supporting.

Rehabilitation Services Provided

The services provided a handicapped individual are planned around the total needs of the individual and the problems he faces with regard to vocational adjustment. It should be emphasized that the primary objective of all rehabilitation services is the realistic and permanent vocational adjustment of the handicapped person.

The services available to meet this objective are quite comprehensive and may include psychological and vocational counseling, as well as medical, psychological, vocational, educational, social, cultural and environmental evaluations. A thorough rehabilitation diagnosis and the formulation of a comprehensive rehabilitation plan are usually carried out and the needed services, as determined by the various evaluations mentioned above, are provided. Handicapped individuals who are eligible receive thorough training. Job placement and follow-up, plus a complete appraisal of the effectiveness of the total rehabilitation program are other services which are furnished.

The rehabilitation counselor is primarily responsible for the determination of the needed services and coordination of these services in an effort to bring the disabled person to his best functioning level. In order to provide services the counselor must determine the presence of a physical or mental disability, the existence of a substantial handicap to employment, and he must be reasonably sure that vocational rehabilitation services will make it possible for the individual to engage in a gainful occupation.

Emphasis of this Study

Vocational evaluation is one of the most important of the rehabilitation services provided handicapped individuals. In a report from the study committee on evaluation of vocational potential, Leslie (1966, p. 1) states:

> "In the last 10 to 15 years, considerable growth and development has occurred in that segment of rehabilitation services known as 'Vocational Evaluation.' As the rehabilitation movement has progressed to the point of greater service to the severely physically and

> emotionally disabled clients and the mentally retarded, the need for comprehensive or extensive vocational evaluation studies has steadily increased. . ."

In a seminar concerning advances and research in vocational evaluation, Bregman (1967, p.1) said:

> "There seems to be general agreement that the utilization of actual or simulated, industrial, service, or commercial operations are an effective instrument in measuring the disabled individual's potentials for integration or re-integration into society."

Further evidence indicating the importance of the vocational evaluation phase of a handicapped person's rehabilitation program is the fact that the 1965 amendments to the vocational rehabilitation act (P.L. 89-333) provide for an individual to remain in an evaluation program for up to 18 months if necessary.

The present study is concerned with that phase of the rehabilitation program which deals with the evaluation of the training and work potential of the handicapped individual. Specifically, it represents an attempt to assess the effectiveness of an innovative technique, the use of short concept films (SCF), as a tool for rehabilitation work evaluators. Further, the relative effectiveness of four types of films (viz., color-sound, color-no-sound, black and white-sound, and black and white-no-sound) is examined.

Statement of the Problem

One of the commonly used approaches to the evaluation of handicapped students'[1] training and work potential is the observation of their performance on a work or job sample. Neff (1968, p. 179) points out that:

> "The work-sample approach to work evaluation has much to recommend it. Its virtues are its strong reality orientation, its close simulation of actual work demands, and the unparalleled opportunity it affords to observe actual work behavior in a reasonably controlled situation."

The use of the work or job sample method usually involves the following:

1. After a careful review of a student's case history, a trained work evaluator will define a job sample appropriate for the

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[1]In the remainder of this paper the terms "handicapped student" or "student" will be used to refer to individuals who are involved in evaluation programs at rehabilitation facilities. Most facilities use this terminology in order to overcome the psychological stigma associated with the term "patient" or, to a lesser extent, the term "client".

student in accordance with the student's needs, capabilities, and interests.

2. To provide a general orientation, the evaluator will describe the total job sample and, in most cases, show the end product of the job sample to the student.

3. The evaluator will demonstrate each step in the job sample, giving particular attention to sequence of steps and emphasizing potentially difficult segments. Where appropriate, the evaluator will stress neatness, safety precautions, and the need for attention to detail.

4. The student is then urged to attempt the job sample on his own. As the student works through the tasks within the sample the evaluator assesses his capabilities, not only with regard to this job sample but noting capabilities which may be appropriate for other job areas.

Research has shown that the interpersonal relationship and the interaction between the evaluator and the student are exceedingly important factors in bringing out the student's potential to the fullest extent (Overs and Cole, 1964; Truax, Fisher, Leslie, Smith, Mitchell, Shapiro and McCormick, 1966). There is a realistic limit, however, as to the amount of time the evaluator can give his attention to any single student when he is attempting to carry out evaluations on several students concurrently.

Because of the relatively low average IQ, the frequent incidence of mental retardation, and the below average academic achievement level of many handicapped students, written directions concerning completion of the job samples are usually of little value. Often, it is necessary for the evaluator to repeat verbal instructions many times, particularly on difficult segments of the job sample. There is a real possibility that the tedious job of repeating verbal instructions concerning segments of a work sample may be tiresome to the evaluator, perhaps decreasing his interpersonal effectiveness, and discouraging to the student, thus producing feelings of frustration and failure. Obviously, one or two students having particular difficulties could monopolize the evaluator's time, to the detriment of the other students, by requiring repetition of verbal instructions on several occasions in order to complete the job sample.

The development of short concept films (SCF) which might help the evaluator overcome this problem would be beneficial. Also, the assessment of the characteristics of the SCF would be extremely important. Questions concerning the relative effectiveness of color as opposed to black and white and sound as opposed to silent should be examined.

Significance of the Study

The value of the interaction and interpersonal relationship between

student and evaluator will be discussed further in the review of related literature. Because of the importance of this aspect of the evaluation program, it is believed that a learning device designed to provide mechanical repetition of difficult steps and sequences in a work sample would enable the evaluator to devote more of his time to the individual needs of all students.

A vital part of student-evaluator interaction takes place during the teaching process. Therefore, it should not be construed that the use of SCF is advocated to replace the teaching function of the evaluator. Rather, it is hoped this study will show that the films can be used as effective tools, freeing the evaluator from the chore of numerous repetition of instructions and thus providing the opportunity for more personal interaction with students.

The four types of SCF used in this study (viz., color-sound, color-no-sound, black and white-sound, and black and white-no-sound) will most probably vary with regard to their effectiveness and efficiency as tools for the evaluator. A determination should be made as to which type film is the most effective and efficient. A determination of this sort has implications not only for the possible help which could be provided for the evaluator and the student, but also with regard to production or purchase cost factors. There is a rather large price difference between sound and silent film and, to a lesser extent, between color and black and white film.

Demonstration of the effectiveness of specific types of SCF which will aid in the evaluation of the training and work potential of handicapped students in rehabilitation facilities might also have direct implications for use in special education classes in the public schools. The films may prove to be valuable tools not only in the evaluation of potential, but in the actual job training process.

Hypotheses to be Tested

The study will be conducted using five experimental groups: four types of SCF groups including color-sound, color-no-sound, black and white-sound, and black and white-no-sound; and a totally verbal evaluation procedure with no film.

The following null hypotheses will be used to test the effects of the use of types of SCF as well as comparisons of types of SCF with verbal procedures.

1. There will be no difference in the learning rate (total time spent on the job sample) between students who are using films and students exposed to the verbal-without-film (VWF) procedure.

2. There will be no difference in the amount of instructional time required of the evaluator when the students are using

the SCF and when they are exposed to the VWF procedure.

3. There will be no difference in the amount of noninstructional time provided by the evaluator when the students are using SCF and when they are exposed to the VWF procedure.

4. There will be no difference in the number of times the evaluator will be required to repeat verbal instructions on difficult tasks within the job sample when the students are using SCF and when they are exposed to the VWF procedure.

5. There will be no difference in the total number of times each film is viewed by the students as they attempt the job sample between the four experimental film types used in the study.

6. There will be no difference in the rated quality of the finished product of the job sample when the students are using the SCF and when they are exposed to the VWF procedure.

REVIEW OF RELATED LITERATURE

Overview

The use of short concept films (SCF) as a tool for evaluators in rehabilitation facilities represents an innovation. No previous research could be found which sought to determine the effectiveness of SCF or to discriminate between the most appropriate types of SCF in assessing the training and work potential of handicapped students in rehabilitation facilities. However, there have been articles and studies concerning the student-evaluator relationship, the job sample method of assessment, and the use of programmed instruction and some types of audio-visual aids with handicapped students. There have also been numerous articles and several studies concerning the use of SCF in conventional educational settings. The most relevant articles and studies concerning the above topics will be presented below, along with the few articles and studies which deal directly with handicapped students' use of SCF.

The Importance of the Evaluator-Student Relationship

The literature seems to support that the evaluator-student relationship is an extremely important factor in the overall evaluation process. Overs and Cole (1964) state that "the way in which the evaluator functions as a therapeutic agent becomes the most significant variable in work evaluation." They point out that a warm relationship between the evaluator and students is vital if learning and insight are to take place. The evaluator needs to spend noninstructional time with the student in order for the student to evaluate and integrate the concept of what he has done on the job sample into his self-concept, according to the authors.

Gelfand (1965) says:

Difficulties, i.e., the defenses, that have risen in the inter-

personal relationship of client and evaluator during the evaluative process are regarded as the primary causative factors in the unemployability of the client. The evaluator must be adaptable enough to meet the needs of a wide range of personality types and his concern for quantitative data tempered by concern for the client as a human being.

A study (Truax et al., 1966) in a large rehabilitation facility showed that empathy, warmth and genuineness contribute significantly to the rehabilitation process in a wide variety of types of handicapped students. Feelings of empathy, warmth and genuineness, generated by work evaluators and all others involved in helping relationships with handicapped students were found to affect adjustment attitudes, motivation and other significant variables in the rehabilitation process.

The results of a study by Shostrom and Knapp (1966) indicate that the student at a rehabilitation facility, particularly one who is just entering a rehabilitation program, is likely to be low in self-esteem and motivation toward self-actualization. The authors point out that this type of student naturally turns to significant others (i.e., counselors, social workers, and work evaluators) for support. Golden, Margolin, and Stotsky (1968) state that in many instances the quality of the interpersonal relationship between professional staff members, including work evaluators, and the handicapped student is more of an incentive factor toward positive growth for the student than material or nonmaterial reward.

Job Samples

The use of work or job samples in the evaluation of the training and work potential of handicapped students is recognized as an effective method by many authorities (Bregman, 1967). Neff (1968, p. 177-179) points out that "vocational rehabilitation has developed the most elaborate system of work-sample evaluation since the psychometric test appears to fail most drastically in assessing the work potential of the physically disabled, the mentally retarded, and the emotionally disturbed." He goes on to say that job samples are reality oriented, simulate actual work demands and provide the evaluator the opportunity to observe the student in actual work behavior.

Cromwell (1959) states that evaluation should always "include measures of manual dexterity, an assessment of work habits and attitudes, and the performance of specific job samples." Wise (1966) observes that "work samples . . . have proven to be effective in the evaluation of work potential." Studies with mental retardates (Ladas, 1961; Burdett, 1963) have also shown this method to be effective in the assessment of training and work potential.

Programmed Learning and Audiovisual Aids

The hardware designed to use the cartridge-type, loop film was

placed on the market for the first time in the early 1960's. The development and refinement of 8mm. and super-8mm. film has taken place within the last seven or eight years. Consequently, it is not surprising that there is a paucity of research dealing directly with the use of SCF. Even less surprising is the fact that a search of the literature revealed few articles concerning the use of SCF with handicapped students and, as pointed out above, no studies were found which compared the effectiveness of the several types of SCF similar to the ones used in this study.

In a very real sense, the SCF used in this study are a type of programmed instruction for handicapped students. Therefore, several studies will be cited which have shown the effectiveness of this type instruction for the population under consideration.

Research by Falconer (1960), Fessant (1963), and Black, O'Reilly, & Peck (1963), indicates that programmed instruction is very effective in teaching new words and lip reading techniques to deaf students. Ashcroft (1961) reports results showing the effectiveness of programmed instruction in teaching basic mastery of reading and writing braille. Mental retardates have benefited from the use of programmed instruction in the acquisition of simple academic skills (Stolurow, 1963; Malpass, Hardy, Gilmore & Williams, 1964; Bradley & Hundziak, 1965). The results of a study by Filby and Edwards (1963) have shown that programmed instruction is quite effective in teaching form discrimination to aphasics.

Several studies have been reported concerning the effectiveness of audiovisual aids which in some instances are quite similar to SCF. O'Neill and Stephens (1959) found lip reading films to be very effective in programs designed to assess lip reading ability. Audiovisual instructional programs designed specifically for use with the mentally retarded have been found to be quite successful for shaping pre-vocational behavior and training in some vocational skills (Aserlind, 1966). For brain damaged students with impaired understanding of verbal communication films were found to be effective in rehabilitation facility orientation programs (Anderson, 1967). Wooden (1966) has successfully used an audiovisual approach to teaching language skills to children with severe hearing impairments.

Newhaus (1964) using a method similar to SCF (viz., slides with audio-taped instructions with each frame), found that mental retardates with IQ's from 60 to 80 rapidly learned an assembly line task in an actual work situation. He stated that this method captured and held the mental retardate's attention and that this was a major contributing factor to learning.

The use of filmstrips and tape recorders as an adjunct to direct therapy in the treatment of aphasia has been found to be very helpful according to Wepman and Morency (1963). The authors reported that this method permitted the patient to proceed at his own rate in testing his capacities, was quite stimulating to most patients, and increased motivation in many instances.

Short Concept Films in Conventional Educational Settings

Several papers were reviewed which indicate the potential for SCF as instructional tools in conventional educational settings. The information presented in these papers has implications for various possible uses of SCF with handicapped students. Articles by Schofield (1962); Forsdale (1962); Dworkin (1964); Anderson (1966); Miller, Page, Hannah and Trinklein (1966) describe uses such as presenting short concepts to homebound students, and bringing local geography, geology, and architecture into the classroom. The articles mentioned above, and studies by Wahl and Blukis (1968), Gausman and Vonnes (1969), Kennedy (1967), and Steiner (1966), discuss the presentation of short concepts in mathematics, biology, chemistry, general science, social studies, and other academic subjects in a unique and interesting manner. Presentation of the concept via SCF allows the student to view the concept repeatedly until it is mastered or understood.

In a study with reading underachievers in a conventional educational setting, Reddick and Estacio (1965) reported that their subjects showed significant improvement after using repetitive 8mm. loop-type films for 30 minutes a day in their remedial reading classes. Gerlack and Flanagan (1964) conducted a study in which SCF concerned with the use of audiovisual aids were used with undergraduate college students enrolled in an audiovisual aids course. The authors pointed out the following benefits in using these self-instructional films:

1. The student observed audiovisual skills performed correctly by an expert and could view the same skill many times until the particular technique was firmly implanted in his behavioral repertoire.

2. Missed demonstrations could be made up because a similar demonstration could be viewed by selecting the appropriate film cartridge.

3. The student could progress at his own rate.

4. Because the projector could be stopped by the viewer at will, certain skills could be practiced before new skills were presented.

5. There was significant saving in instructor time, allowing each instructor more individual time with each student.

Benefits similar to the ones presented above should accrue to handicapped students when they are presented with SCF appropriate for their intellectual and academic level.

Short Concept Films for Handicapped Students

Bitter and Bolanovich (1966) state that "exploratory experiences

with 8mm film loops at the Work Experience Center (St. Louis, Missouri) have indicated that the obstacles to job training of the mentally retarded can be diminished." The authors also state that SCF will be used at the Work Experience Center with mental retardates in film assisted counseling, instruction in general work adjustment behaviors which are related to vocational development, and specific training in workshop tasks. They point out that the SCF provide an orientation to relatively abstract job concepts as well as specific instruction in job duties and responsibilities.

A study by Stepp (1966) has shown that 8mm. SCF are of significant value as tools in teaching deaf, or near deaf, children to speech read. Nace (1965) has also shown that SCF can be used effectively as instructional tools when teaching deaf students to operate a keypunch machine. The SCF were used for particularly difficult segments so that students could view these segments repeatedly without taking up instructional time.

Forsdale (1966) has pointed out the following advantages of SCF specifically designed for use by handicapped students:

1. The use of the SCF helps to hold the attention of the student during task performance.

2. The simplicity of operation and the ease of viewing are very attractive assets of SCF.

3. Handicapped students, often slow learners at best, are allowed to learn at their own rate when using these tools.

4. The use of SCF fosters a sense of independence in the handicapped student.

The positive statements concerning SCF reported in the literature are encouraging. However, it should be emphasized that many of the citations above represent articles which report opinions based on experience and observation rather than controlled research. The undertaking of this study represents an effort to determine the relative effectiveness of this tool for the work evaluator in a rehabilitation facility under controlled experimental conditions.

CHAPTER II

METHODS AND PROCEDURES

Overview

The primary purpose of this study is to evaluate the effectiveness of short concept films (SCF) in assessing the training and work potential of handicapped students. Presented in this chapter are the methods and procedures used to accomplish this purpose. The material has been divided into six sections: (1) a brief description of the process of job sample selection and film production, (2) evaluator training procedures, (3) some characteristics of the sample, (4) the overall design of the study, (5) a description of the job sample tryout, and (6) the experimental hypotheses and the statistical treatment of the data.

Job Sample Selection and Film Production

In order to select the most appropriate job sample for filming, step-by-step analyses were performed on tasks such as using a stencil cutting machine, taping florist wire, replacing a small engine head gasket, use of the jeweler's saw, and the "setup" and the use of a jeweler's engraving machine. These analyses involved a thorough study of the procedures used to accomplish each step of a job sample.

The job samples selected for filming and use in this study were: (1) the "setup" or preparation prior to the actual work to be done on a jeweler's engraving machine, and (2) the actual use of the engraving machine. These samples were selected based on the following considerations:

1. The tasks within the job sample required the student to exhibit skills such as measuring, handling small objects, and eye-hand coordinated movement. The student was also required to exercise critical judgement with regard to certain parts of the actual engraving process. These skills are applicable to many types of jobs and the observation of a student's performance of them is an important aspect of the assessment procedure.

2. Engraving machines of the type used in this study are commonly used commercially for a variety of engraving jobs from work on expensive gold and silver objects to the production of name plates and plastic signs. Thus, good performance on the job samples indicated possible apptitude for training and the development of a marketable skill.

3. The tasks are relatively simple and can be completed by all but the most severely handicapped.

4. The job samples are in logical sequence which allowed for relatively uncomplicated filming and provided the most convenient presentation schedule for the evaluator charged with the responsibility of data collection.

In the first job sample the student is required to clean the work area on the engraving machine, remove the letters needed to spell the word "engrave" from a tray of letters arranged in alphabetical order, and center these letters on an alphabet slide which is located on the machine (see Figure 1). This job sample represents the "setup" in advance of the actual engraving process.

On the second job sample the student is required to center a small metal plate, which is to be engraved, on a work holder located on the machine. It also involves the actual engraving process in which the student must correctly manipulate the tracing and cutting styli.

The films used in the study were produced by an innovation grant from the Georgia State Department of Education, Division of Vocational Rehabilitation, Atlanta, Georgia. Every effort was made to assure that the films produced would be appropriate and effective when used by handicapped students. Two months were required for preproduction planning and research into previous use of SCF as well as other graphic media used with this population. A description of the required preproduction planning, research, and steps in production were prepared and incorporated into the final contract with the film production company.

The evolution of programmed instruction has led to an emphasis on individualizing the instruction-learning process. Schwep and Aldredge (1969, p. 7) describe an important characteristic of the films used in this study which represents an attempt to actively involve the student in this process. They say:

> Very few films exist which are appropriate to the simple tasks of the evaluation program at GRC. And those few which do exist are, in effect, photographed demonstrations. That is, the learner sees the film precisely as he sees the instructor doing a task which he asks him to emulate. In other words, his point of view is that of watching another do a task. Not that of doing it himself.
>
> Because it is believed that the subjective approach is important in the learning process, the GRC films have been designed so that the learner observes every action as though he himself were performing it. The camera is, in effect, the eyes of the learner as the learner undertakes the task himself.
>
> This subjective technique enhances the possibility of interesting, or dramatic reverse angles, side angles, etc. Closeups are possible for emphasis of particular points. But still from the point of view of the observer.
>
> This I-am-a-camera technique is either unique, or nearly so, to this type of film making.

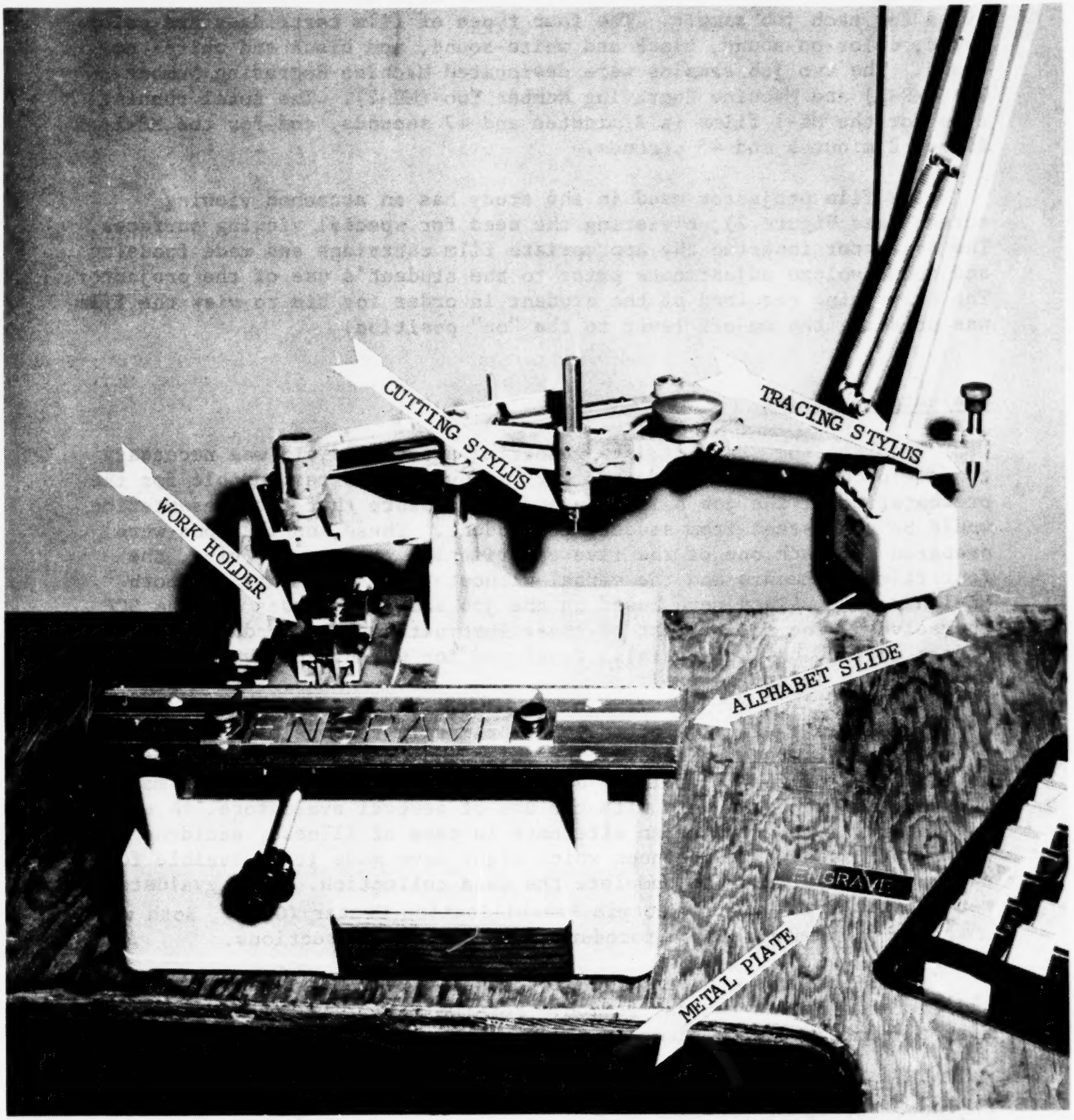

Figure 1. Jeweler's engraving machine with essential parts labeled.

A total of eight film cartridges were used in the study; four types for each job sample. The four types of film cartridges are color-sound, color-no-sound, black and white-sound, and black and white- no-sound. The two job samples were designated Machine Engraving Number One (ME-1) and Machine Engraving Number Two (ME-2). The total running time for the ME-1 films is 2 minutes and 47 seconds, and for the ME-2 films, 2 minutes and 45 seconds.

The film projector used in the study has an attached viewing screen (see Figure 2), obviating the need for special viewing surfaces. The evaluator inserted the appropriate film cartridge and made focusing and sound volume adjustments prior to the student's use of the projector. The only thing required of the student in order for him to view the film was pressing the on-off lever to the "on" position.

Evaluator Training

Prior to the start of data gathering activities, it was necessary to develop detailed instructions for the evaluators responsible for the presentation of the job sample in order to assure that the presentation would be consistent from student to student. These instructions were prepared for each one of the five experimental treatments (viz., the four film treatments and the verbal-without-film treatment) for both ME-1 and ME-2. They were based on the job sample analyses and the SCF themselves. The entire text of these instructions is found in Appendix A. A data collection form was also developed for use by the evaluatcrs and can be found in Appendix B.

One evaluator was selected to be primarily responsible for collecting all of the data for the study. The selection of only one evaluator was an effort to reduce variability and to minimize bias error which may have contaminated the data with the use of several evaluators. A second evaluator was selected as an alternate in case of illness, accident or other unforeseen circumstances which might have made it impossible for the primary evaluator to complete the data collection. Both evaluators were on the staff of the Georgia Rehabilitation Center (GRC). Both were required to memorize the procedures and verbal instructions.

The procedures and verbal instructions were rehearsed many times and mastered over a two-day period. For two additional days "dry runs" were accomplished with students who were not included in the study.

Characteristics of the Sample

An experimental sample of 135 handicapped students enrolled at GRC participated in the study. Six to eight students are enrolled at GRC each week and their selection for enrollment in any particular week is not determined in any systematic way on the basis of handicap, intelligence, education level or other significant variables. In addition, all students who were enrolled at GRC at the start of data collection were placed in treatment groups using methods to assure randomization. It

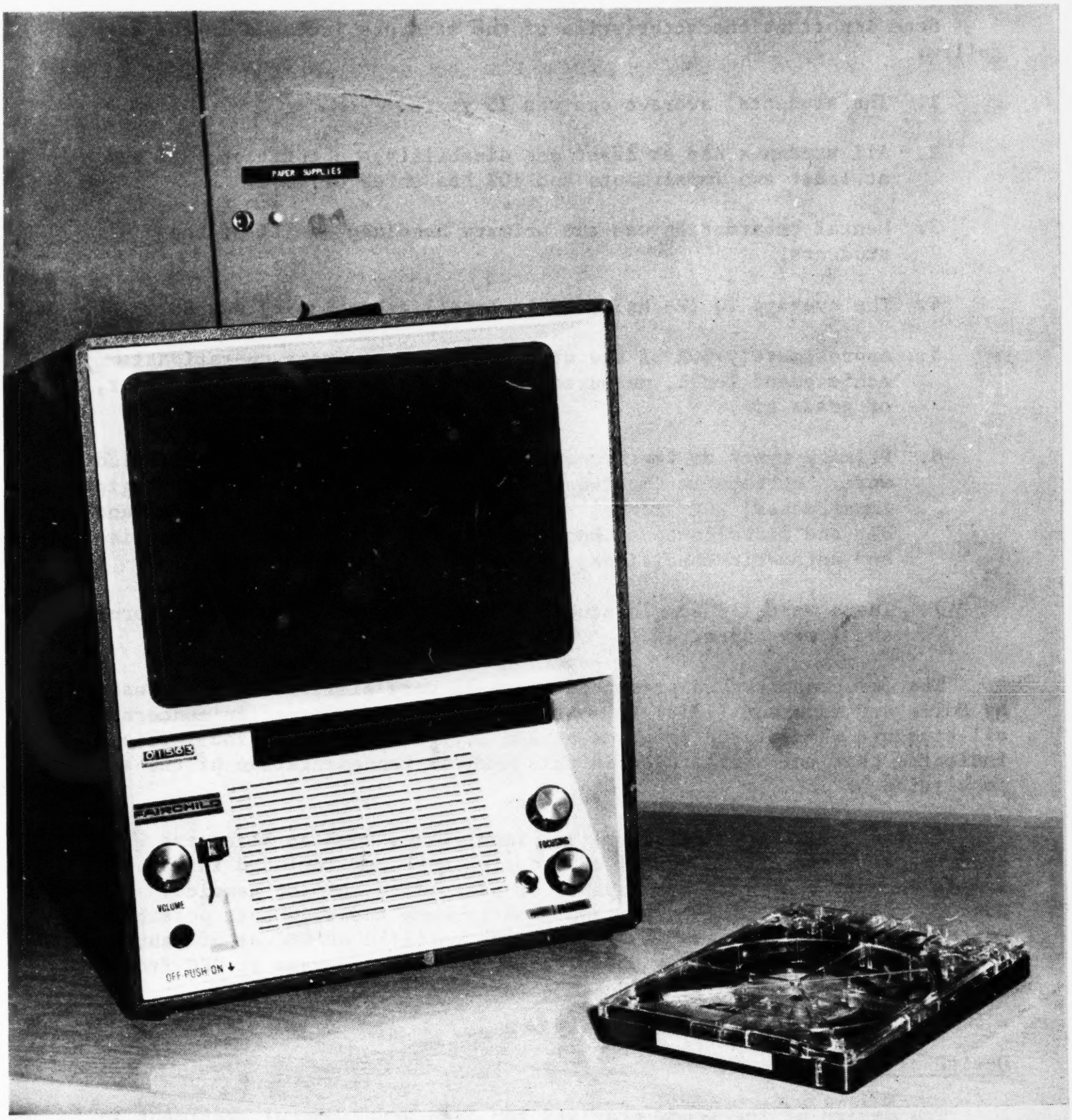

Figure 2. The projector used in the study. Note the viewing surface and film cartridge.

was thus concluded that the sample was randomly selected and assigned to one of the five experimental treatments.

Some important characteristics of the students included in the sample follow:

1. The students' average age was 25 years.

2. All students had at least one disability; in addition, 36% had at least two impairments and 10% had three or more.

3. Mental retardation was the primary handicap of 11% of the students.

4. The average IQ (Wechsler Adult Intelligence Scale) was 88.

5. Approximately 90% of the students had an average operational achievement level, measured by the Wide Range Achievement Test, of grade six.

6. Primary types of impairments with percentage of students included were: orthopedic impairment limiting mobility, 42%; neurological impairments, 20%; mental retardation, 11%; emotional disturbances, 8%; and miscellaneous impairments such as diabetes, hemophilia and asthmatic conditions, 19%.

7. There were 110 single students, 20 were married, 4 were divorced, and 1 was separated.

The demographic data presented above is very similar to that presented by Nolan and Anderson (1968) in a study which gave information concerning all students who entered programs at GRC over a two-year period. This indicates that the sample used in this study is representative of the student population at GRC.

Students with physical or mental impairments such as blindness, quadriplegia, and severe mental retardation were not included in the sample because they were not capable of performing the job samples. However, all other students who appeared to have the slightest possibility of completing the job samples and who were enrolled at GRC as of January 6, 1969, and those students who subsequently entered programs at GRC from January 6, 1969 to June 6, 1969, were included in the sample.

Design of the Study

The design of the study provided for each experimental treatment to be presented for one full week. That is, the verbal-without-film treatment was presented for one complete week, then the black and white-no-sound treatment for one complete week, then black and white-sound for a week, and so forth until all five treatments had been presented. After all five of the treatments had been presented once, they were presented again, each for a week at a time. Rotation of treatments continued in this manner

until a total N of 135 (i.e., 27 students for each experimental treatment) had been attained.

The order of presentation of treatments within each five-week block was randomly selected by use of numbers chosen from the Greater Atlanta, Georgia, telephone directory. The method of randomly selecting the treatments for presentation involved the following steps:

1. A page was arbitrarily chosen from the directory and a telephone number was randomly selected from one of the three columns on that page.

2. Ignoring the initial three digits of the number (the prefix), the first digit, if a 1, 2, or 3, determined the column to be used in selecting the next number. When the first digit was greater than the number three, the next number in sequence was selected until the first digit was a 1, 2, or 3.

3. The last three digits of the telephone number represented the page number to be used next. For example, if the phone number 746-1079 was initially selected, the next number would be taken from page 79, column 1.

4. Using the above method to choose the next page and column number, the first phone number in the appropriate column was selected to determine the treatment number of the week. If the last digit of this number was five or smaller, then it was used as the treatment number. If it was larger than five, then the next number in sequence was chosen until a 1, 2, 3, 4, or 5 appeared.

This procedure was repeated until a treatment had been selected for each week for four, five-week blocks of treatments. The complete treatment-by-week schedule which was used in the study is found in Appendix C.

The random assignment of treatment to week, together with the aforementioned GRC enrollment policy and the random assignment of residents to treatments, guarded against high ability students being assigned to one treatment condition and low ability students being assigned to another.

Job Sample Tryout

The actual job sample tryout by the student (see Figure 3) involved the following steps:

1. The evaluator made a thorough inspection of the machine and the experimental area to be sure that the student was equipped to begin work with no distractions or delays.

Figure 3. Evaluator James McPhail demonstrates the use of the engraving machine to a GRC student.

2. The evaluator prepared a data collection form, called the student into the experimental area, and noted the start time.

3. If the verbal-without-film treatment was presented, the standard verbal instructions were given to the student. After presentation of the instructions, the student was allowed to ask related questions but was asked to hold any other questions until after completion of the job sample. When all job sample related questions were answered to the student's satisfaction, the evaluator left and the student began work on the tasks.

4. If one of the filmed treatments was presented, the evaluator explained how the projector was operated, but gave no instructions concerning the job sample. If the student asked job sample related questions he was encouraged to view the films and then if he failed to understand how to carry out a task, to call the evaluator. When the evaluator was satisfied that the student understood the operation of the projector, he left and the student began by viewing the film and then working on the tasks.

5. The evaluator remained close by, observing, in an unobtrusive manner, the student's performance on the job sample and answering questions, if any, that the student had with regard to the tasks.

6. Upon completion of the job sample, the student and the evaluator participated in a loosely structured interview in which the student was encouraged to talk with the evaluator and ask any questions he might have regarding the job sample or any other subject. This time spent together was operationally defined as noninstructional time.

7. These same procedures were followed for both ME-1 and ME-2 which were presented with a 10 to 15 minute break in between.

The evaluator obtained the following measures during the total time the student was involved in the job sample tryout:

1. The total time the student spent on the task.

2. The amount of instructional time that was spent with the student. A stopwatch was used for precise measurement and then the time was rounded to the nearest half-minute.

3. The amount of noninstructional time, as described above.

4. The total number of repetitions of verbal instructions and directions provided the student.

5. The total number of SCF runs by the student when the film treatments were being used. The projector is equipped with a counter that records each complete run-through of the loop film.

6. The total number of plates used and a rating of the quality of the final plate which was produced when the student completed ME-2. The criteria for rating the quality of the plates are found in Appendix A, Evaluator Instructions.

Experimental Hypotheses and Statistical Treatment

Using the methods and procedures described above, the following experimental hypotheses will be tested:

1. There will be no significant difference in the total time, measured in minutes, students spend on the job sample.

2. There will be no significant difference in the actual instructional time, to the nearest half-minute, required of the evaluator by each student as he is exposed to the five experimental treatments.

3. There will be no significant difference in the amount of non-instructional time, to the nearest half-minute, the evaluator spends with each student when the students are exposed to the different experimental treatments.

4. There will be no significant difference in the total number of times the evaluator will be required to repeat verbal instructions and directions concerning tasks within the job sample to the students when they are exposed to the five experimental treatments.

5. There will be no significant difference in the number of film runs by students as they attempt the job sample tasks using the four different film types.

6. There will be no significant difference in the quality of the finished plate when ME-2 is attempted, nor will there be a significant difference in the total number of plates damaged when the students are exposed to the five experimental treatments.

Testing of the statistical hypotheses for the study will involve an overall F test and a Duncan's multiple Range Test on the treatment means. The .05 level of significance will be considered the point at which the null hypotheses will be rejected. Correlations among the relevant experimental variables in the study will also be computed.

CHAPTER III

RESULTS OF THE STUDY

Overview

The results of the statistical analyses of the data will be reported in this chapter. The findings for Machine Engraving Number One (ME-1) will be presented first, followed by the results for Machine Engraving Number Two (ME-2). A table of intercorrelations among relevant experimental variables will be presented and the more significant relationships will be listed. A brief summary will be given in the final section.

Machine Engraving Number One Results

The means for all of the measurements (viz., total time, instructional time, noninstructional time, number of repeated instructions, and number of film runs) made in the study on ME-1, by experimental group, are found in Table 1. The .05 level was selected as the critical point of significance for both the F ratio and the Duncan's Multiple Range Test (DMRT). Each of the hypotheses, in the same order as stated in Chapter II, will be examined as follows:

1. With regard to the total time students spend on the job sample, the null hypothesis is rejected. Differences among the treatment groups are significant at the .01 level ($F=6.393$, with 4 and 130 d_f). The results of the DMRT analysis indicate that color-sound and verbal-without film treatments require less total time on the tasks than the black and white-no-sound treatment. The other mean differences are insignificant by DMRT.

2. With regard to the amount of instructional time required by students, the null hypothesis is rejected. The overall F test value was 477.977 which is highly significant ($P < .001$, with 4 and 130 d_f). The results of the DMRT analysis indicate that the amount of instructional time was significantly less for the four film treatment groups than for the verbal-without-film group. At this point, it should be noted that by the very nature of the standard instructions the presentation of the verbal-without-film treatment requires more time than the film treatments. This result will be discussed further in Chapter IV.

3. With regard to the noninstructional time provided by the evaluator and requested by the students, the null hypothesis is rejected. The overall F test is significant at the .01 level ($F=3.347$, with 4 and 130 d_f). The DMRT analysis indicates that when students are exposed to the no-sound films, more noninstructional time is spent with them than when they are exposed to the other treatments.

TABLE 1

Machine Engraving Number One Group Means for Study Variables

Group	Total Time[a]	Instructional Time[a]	Noninstructional Time[a]	Number of Repeated Instructions	Number of Film Runs
Color-Sound	12.889	2.111	1.093	0.185	1.926
Color-no-Sound	16.926	2.185	1.278	0.148	2.815
Black and White-Sound	16.111	2.204	1.037	0.222	2.667
Black and White-no-Sound	18.889	2.352	1.778	0.444	3.074
Verbal-without-Film	11.296	6.796	0.833	0.037	---

[a]Measured in minutes

4. With regard to the number of times instructions are repeated by the evaluator, the null hypothesis is neither rejected nor accepted because the F test results and the DMRT results are somewhat contradictory. The overall F test is insignificant (F=1.714, with 4 and 130 d_f), but the results of the DMRT analysis indicate that the black and white-no-sound treatment group requires significantly more repeated instructions than the verbal-without-film group. No other mean differences are significant by DMRT.

5. With regard to the total number of film runs, the null hypothesis is rejected. The overall F test results indicate significant differences in the treatment means (F=3.188, with 3 and 104 d_f). However, the results of the DMRT analysis suggest only that black and white-no-sound and color-sound mean differences are significant.

Machine Engraving Number Two Results

The means, by experimental group, for all of the measurements (viz., total time, instructional time, noninstructional time, number of repeated instructions, number of film runs, and number and quality of plates) made in the study on ME-2 are found in Table 2. The .05 level was selected as the critical point of significance for both the F ratio and the Duncan's Multiple Range Test (DMRT). Each of the hypotheses, in the same order as stated in Chapter II, will be examined as follows:

1. With regard to the total time students spend on the job sample, the null hypothesis is accepted. Significant differences in the means are not indicated by either the F test (F=1.582, with 4 and 130 d_f) or by DMRT analysis.

2. With regard to the amount of instructional time required by students, the null hypothesis is rejected. The overall F test indicates significant mean differences at the .01 level (F=396.582, with 4 and 130 d_f). Results of the DMRT analysis suggest only that the verbal-without-film group requires more instructional time than the film treatment groups. Again, note that the design of the study is structured so that the amount of time required in giving the standard instructions is greater for the verbal-without-film treatment than for any of the film treatments.

3. With regard to the noninstructional time provided by the evaluator and requested by students, the null hypothesis is accepted. No significant mean differences were found either by the overall F test (F=1.441, with 4 and 130 d_f) or by DMRT analysis.

4. With regard to the number of times instructions are repeated by the evaluator, the null hypothesis is rejected. The results of the overall F test indicate significant mean differences at the .01 level (F=5.161, with 4 and 130 d_f). The DMRT results show that the black and white-no-sound treatment

TABLE 2

Machine Engraving Number Two Group Means for Study Variables

Group	Total Time[a]	Instructional Time[a]	Noninstructional Time[a]	Number of Repeated Instructions	Number of Film Runs	Number of Plates	Plate Quality
Color-Sound	17.037	1.148	2.870	0.074	2.000	1.037	3.333
Color-no-Sound	19.185	1.074	2.093	0.074	3.111	1.111	3.222
Black and White-Sound	19.741	1.074	2.000	0.037	2.556	1.148	3.444
Black and White-no-Sound	21.519	1.519	3.019	0.556	2.926	1.593	2.815
Verbal-without-Film	16.667	5.352	3.204	0.111	---	1.074	3.444

[a]Measured in minutes

group requires more repeated instructions than any of the other groups.

5. With regard to the total number of film runs, the null hypothesis is rejected. Overall F test results suggest that there are significant mean differences among the five experimental treatments (F=3.222, with 3 and 130 d_f). The DMRT results also indicate significant mean differences in that color-sound requires significantly fewer runs than color-no-sound.

6. With regard to the number of plates used, the null hypothesis is neither rejected nor accepted. Again, the F test and DMRT results are somewhat contradictory. There are no significant mean differences according to results of the overall F test (F=1.863, with 4 and 130 d_f), but the DMRT results suggest that the color-sound and verbal-without-film groups require fewer plates than the black and white-no-sound group. With regard to the plate quality (rated from 1-poor to 5-excellent), the null hypothesis is rejected. The results of the overall F test indicate that the mean differences are significant (F=3.415, with 4 and 130 d_f). The DMRT results indicate that the black and white-no-sound film treatment produces significantly inferior plate quality.

Intercorrelations Among Relevant Variables

Intercorrelations among relevant experimental variables in the study are presented in Table 3. Some of the more interesting relationships which are made apparent by inspection of Table 3 are as follows:

1. The data suggest that as there is an increase in the total number of times the student runs through the film, there is an increase in the total time on the tasks, the instructional time required, and the number of times instructions are repeated. There also appears to be a fairly strong relationship between the number of film runs for ME-1 and ME-2, that is, the more film runs for ME-1, the more for ME-2.

2. The data do not support any expected relationship between total time on the job sample and required instructional time. The relationship between these two variables is not significant and tends to be slightly negative for both ME-1 and ME-2. There is, however, a fairly strong relationship between the total time on the job sample and the number of repeated instructions, particularly on ME-1. It would appear that the more total time students spend on the job sample, the more they need to have instructions repeated. The data also suggest that the more total time a student spends on the ME-1 tasks, the more he will spend on the ME-2 tasks.

TABLE 3

Intercorrelations Among Relevant Experimental Variables in the Study

	MACHINE ENGRAVING NUMBER ONE				
Variable	1 Film Runs*	2 Total Time	3 Instructional Time	4 Noninstructional Time	5 Repeated Instructions
1	1.000	.772	.589	.140	.662
2	.772	1.000	-.142	.333	.736
3	.589	-.142	1.000	-.145	.036
4	.140	.333	-.145	1.000	.136
5	.662	.736	.036	.136	1.000
6	.656	.648	.541	.068	.554
7	.315	.588	-.035	.218	.463
8	.242	-.170	.942	-.098	-.039
9	-.139	-.118	.130	.299	-.087
10	.368	.394	-.009	.181	.382
11	.341	.333	.034	.135	.241
12	-.219	-.319	.109	-.110	-.111

*N=108--for this variable; N=135--for all other variables

TABLE 3 (continued)

MACHINE ENGRAVING NUMBER TWO

Variable	6 Film Runs*	7 Total Time	8 Instructional Time	9 Noninstructional Time	10 Repeated Instructions	11 Number of Plates	12 Plate Quality
1	.656	.315	.242	-.139	.368	.341	-.219
2	.648	.588	-.170	-.118	.394	.333	-.319
3	.541	-.035	.942	.130	-.009	.034	.109
4	.068	.218	-.098	.299	.181	.135	-.110
5	.554	.463	-.039	-.087	.382	.241	-.111
6	1.000	.642	.410	-.135	.427	.533	-.326
7	.642	1.000	-.005	.151	.431	.497	-.343
8	.410	-.005	1.000	.111	.147	-.021	.039
9	-.135	.151	.111	1.000	-.035	-.018	.098
10	.427	.431	.147	-.035	1.000	.200	-.304
11	.533	.497	-.021	-.018	.200	1.000	-.248
12	-.326	-.343	.039	.098	-.304	-.248	1.000

*N=108--for this variable; N=135--for all other variables

3. The amount of instructional time required on ME-1 is highly correlated with the amount of instructional time on ME-2; the more instructional time required on ME-1, the more required for ME-2. However, the data indicate very little relationship between instructional time and noninstructional time or between instructional time and the number of repeated instructions on the job samples.

4. Concerning the number of plates used and plate quality on the ME-2 job sample, the expected relationships are confirmed by the data. That is, the larger the number of film runs and the greater amount of total time, the greater the number of plates used and the poorer the overall plate quality.

Summary of the Study Findings

To summarize the findings presented above, it appears that the color-sound and verbal-without-film treatments require less total time on the ME-1 job sample than the black and white-no-sound treatment. However, there are no mean differences with regard to total time on ME-2. For both ME-1 and ME-2, the film treatments require significantly less instructional time than the verbal-without-film treatment. This could be predicted, of course, because of the nature of the standard instructions. No-sound films seem to encourage more noninstructional time than the other treatments on the ME-1 job sample, but there are no mean differences on this variable for ME-2. As expected, the color-sound films required fewer runs for both ME-1 and ME-2. More plates are needed and the overall quality is poorer when the black and white-no-sound treatment is presented. Finally, there are significant intercorrelations among several of the study variables.

CHAPTER IV

DISCUSSION OF RESULTS AND CONCLUSIONS

Overview

The purpose of this study was to determine whether or not short concept films (SCF) are effective evaluator tools for explaining the steps necessary for the performance of job samples used to assess handicapped students' potential for training and work. A secondary objective was to determine which of four types of SCF was most effective.

The rationale for the study rests upon the assumption that a reduction in the amount of time required by the evaluator to give job sample instructions would be materially reduced by utilization of SCF. It was hypothesized that this procedure would enable the evaluator to more adequately meet the needs of all of his students.

The sample for the study consisted of 135 handicapped students at the Georgia Rehabilitation Center, Warm Springs, Georgia. The students were given instructions on how to complete two job samples related to the use of a jeweler's engraving machine. The instructions concerning the tasks to be performed on the machine were given by an evaluator using a verbal-without-film method, by a color-sound film, a color-no-sound film, a black and white-sound film, and a black and white-no-sound film. Each of these methods for presenting the instructions was used for one week at a time (for a total of 20 weeks) until 27 students had been exposed to each of the five treatment methods.

The following null hypotheses related questions were formulated concerning the use of SCF in rehabilitation evaluation programs:

1. Can the use of SCF significantly decrease the total time it takes for a student to complete a job sample?

2. Can the use of SCF significantly reduce the amount of instructional time required of an evaluator in explaining the steps necessary for the student to complete a job sample?

3. Does the evaluator spend more noninstructional time with students when they are using SCF?

4. When SCF are used by a student, can the number of repetitions of instructions ordinarily associated with the performance of a job sample be reduced?

5. When the student relys on SCF to complete a job sample, which type of film must be viewed the fewest number of times? Which type requires the largest number of runs?

6. When students use SCF, is the quality of their work effected?

In this chapter the findings for each of the questions stated above will be discussed. In addition, recommendations and conclusions will be summarized in the final sections.

Total Time

Can the use of SCF significantly decrease the total time it takes for a student to complete a job sample? The results of the study indicate that the answer is no, the use of SCF does not decrease the total time spent on the job samples. In fact, the lowest mean total time for both the Machine Engraving Number One (ME-1) job sample and Machine Engraving Number Two (ME-2) was that of the verbal-without-film treatment group. The color-sound film treatment, however, was almost as effective as the verbal-without-film treatment, requiring an average of about one and a half minutes longer on ME-1 and about one-half minute longer on ME-2.

Thus, little student time is saved when SCF are used to complete job samples. However, the instructional time required of the evaluator is significantly different when the student is using films and when he has the verbal-without-film treatment. This point will be discussed further in the next section.

There appears to be little or no relationship between the total time on the job sample and the instructional time. In other words, one could not say that the more total time a student spends on a job sample, the more instructional time required. This result may be an artifact of the study, however, in that the presentations of instructions were standard for all treatments. The differences in the amount of instructional time can probably be accounted for to a large extent by the actual time required for the evaluator to give the standard instructions.

The data confirm a rather logical expectation, that is, the more instructional time required on the job samples, the more repeated instructions required. In other words, if the student finds the tasks rather difficult he will naturally take longer to complete them and will require more assistance from the evaluator. Another logical relationship that is confirmed is that the more total time a student spends on the ME-1 tasks, the more he spends on the ME-2 tasks.

Instructional Time

Can the use of SCF significantly reduce the amount of instructional time required of an evaluator in explaining the steps necessary to complete a job sample? The answer is yes. The only significant mean differences suggested by the data analyses were between the verbal-without-film treatment and the film treatments. As pointed out above, and as can be seen by

reference to Appendix A (Evaluator Instructions), it ordinarily requires more time to present the verbal-without-film instructions than it does to present the instructions for the film treatments. This fact was known before data collection began. However, the results of the analyses indicate that very little additional time was required of the evaluator in any of the experimental treatments.

A comparison of the time required to go through a presentation with no student questions whatsoever, and the mean instructional time which included all student questions and repeated instructions, verifies this assumption. The time for the former is approximately five and one-quarter to five and one-half minutes for ME-1 no film, and approximately two and one-half minutes for the film treatments. The times including student questions and repeated instructions are about six and three-quarters minutes for ME-1 no film and about two and one-quarter minutes for the ME-1 film treatments. A similar ratio is found for the ME-2 job sample. As pointed out above, this comparison suggests that very little additional time is required of the evaluator after the initial instructions are given. A look at the mean number of times instructions are repeated (an average of less than one time per student for all treatments) also verifies the assumption.

These results lend strong support for the contention that using well prepared standard instructions is an effective method for teaching students the steps necessary to complete a job sample. The results also suggest that the film treatments are quite as effective as the verbal-without-film method in presenting these instructions and generally require only about one-third as much evaluator instructional time.

These results tend to verify the assumptions made by L. Forsdale and J. Forsdale (1962; 1966) concerning the effectiveness of SCF and the appropriateness of using these tools with handicapped students. They also support the general findings of Bitter and Bolanovich (1966), Stepp (1966), and Nace (1965) which suggested that SCF could be of significant value as tools in the instruction of handicapped students.

Noninstructional Time

For purposes of obtaining accurate measurement of film effects in this study, noninstructional time was operationally defined as time the evaluator spent with the student at the completion of the job sample in a loosely structured interview.

In a sense this measure represented an estimate of the degree to which the student understood what he was doing on the job sample and how much he was willing to discuss his difficulties with the evaluator. Students who understood the tasks and had no difficulties with the engraving machine should have required a shorter amount of noninstructional time unless problems unrelated to the job sample were discussed. The evaluator was encouraged to discuss anything the student

wished to talk about.

Obviously, this variable will fluctuate a great deal depending on the personality characteristics of the evaluator. To eliminate as much variability as possible on this measure (in order to concentrate on film effects) one evaluator collected all of the data for the present study. Although the data analyses suggested the expected results (the no-sound-films generally prompted more noninstructional time than the other treatments), the total amount of average noninstructional time was quite brief and ranged across treatments from a little under one minute to a little under two minutes for the ME-1 job sample, and from two minutes to a little over three minutes for ME-2. Besides showing that the average noninstructional time was quite brief, these results also suggest that the students probably found the ME-2 job sample a bit more difficult than the ME-1 job sample. However, additional research is needed in an effort to determine the effects of various evaluator personality characteristics on this variable.

There is an additional way in which noninstructional time can be considered. If the evaluator's instructional time is reduced approximately two-thirds by the use of SCF, then it is not unreasonable to assume that the evaluator has the opportunity to spend more noninstructional time with students. Noninstructional time in this instance being time used to enhance the evaluator-student interpersonal relationship which previous research (Overs & Cole, 1964; Truax et al., 1966; Golden et al., 1968) has shown to be vital in the rehabilitation process.

The answer, then, to the specific question for this study of whether or not the evaluator spent more noninstructional time with students when they were using SCF is, yes, he did on the ME-1 job sample, and he probably did not on the ME-2 job sample.

Again, these results might well be interpreted in terms of the degree to which students understood the instructions provided both by the films and the verbal-without-film treatment. It is possible that such factors as decreased anxiety caused by more familiarity with the machine and the experimental surroundings, or getting used to the evaluator or the use of the film projector, had significant effects on the degree of student understanding. However, the data analyses on this variable indicate that the ME-1 no-sound film and the ME-2 black and white-no-sound film and verbal-without-film treatments are probably the most difficult to follow.

Repeated Instructions

In general, it seems that evaluator use of well prepared standard instructions, based on carefully done job sample analyses, is a very effective method for reducing the necessity for repeating instructions.

This study was undertaken, in part, as a result of observation and of reports from work evaluators that one of the most time-consuming aspects of the evaluation process is the necessity of repeating over and

over again the instructions concerning difficult segments of a job sample. The results of this study suggest that only the black and white-no-sound film treatment requires significantly more repeated instructions. Even this treatment required well below an average of one time per student. In other words, many students did not require any of the standard instructions to be repeated. This finding is highly significant when one considers the fact that in many rehabilitation facilities a large percentage of the job sample instructions are not standardized but are based solely on the evaluator's experience with the sample. This means that the content of instructions could vary considerably from student-to-student.

The results of the data analysis on this variable also suggest that black and white-no-sound filmed instructions are the most difficult to follow and consequently require the most repeated instructions for ME-1 and ME-2. An expected positive relationship between total time on the job samples and the number of times instructions were repeated is confirmed. That is, the longer a student spends on a job sample, the more times he is likely to need repeated instructions.

However, the study results really provide no clear-cut answer to the question of whether or not the use of SCF can significantly reduce the number of repetitions of instructions on difficult segments of a job sample. Based in part on observation and in part on the study results, an assumption is made that when standard instructions are used the differences are insignificant in the number of times instructions must be repeated. But, when instructions are unstructured they frequently need to be repeated a significant number of times. Research comparing presentation of instructions by standard procedures, SCF procedures, and individual evaluator procedures would provide a more definitive answer.

Number of Film Runs

When the student relies on SCF to complete a job sample, which type of film must be viewed the fewest number of times? An examination of the analyses of the data leaves little doubt that color-sound film is the most effective treatment. However, for both ME-1 and ME-2, the black and white-sound film ran a close second. Therefore, one could safely say that the sound films are more effective than the no-sound films

However, both the black and white-no-sound film and the color-no-sound film, required only an average of apporximately three runs. These results together with the findings presented above concerning total time on the job samples and the number of repeated instructions, should encourage the use of the type SCF which represents a compromise between those which are appropriate for the student, the job sample, and the budget.

In many instances the job sample itself determines to a large degree the type of SCF which must be used. For example, some job samples involving certain simple tasks in the field of electronics could not be done in black and white because many electrical components are color coded. A process such as silk-screen painting would be extremely difficult to explain without sound because of the numerous intricate and critical steps in this job sample. However, many job samples, while they might give excellent results in color-sound, can probably be done in black and white-no-sound with good results. This point is mentioned because there is a rather large price differential between color-sound and black and white-no-sound film. Many rehabilitation facility budgets could not include color-sound films but could afford to have black and white-no-sound. In summary, color-sound film is the most effective type, however, the results of this study indicate that in general, any one of the four types of films can be very effective as an instructional tool.

Additional research is needed comparing the effectiveness of professionally made SCF of typical job samples used at rehabilitation facilities, "home made" SCF of job samples, and the few SCF commercially available which may be appropriate for use in work evaluation programs.

Number and Quality of Plates

When students use SCF is the quality of their work effected? Results of the study suggest that the use of SCF has very little effect on the number of plates used, or on the quality of the final plate. The black and white-no-sound film treatment group used an average of about one and a half plates per student while the other treatment groups used an average of about one plate per student.

The overall rating of the plate quality of the black and white-no-sound film treatment group was 2.815 (very close to a "good" rating), while the other treatment groups' average ratings ranged from 3.222 to 3.444 (approximately "good-plus"). Therefore, although the statistical analyses suggest that there are significant differences between the black and white-no-sound group mean and the other treatments' group means, the numerical values of the differences are relatively small (from .407 to .629).

Again, these results suggest that SCF methods of presenting instructions for the completion of job samples can be just as effective as verbal-without-film methods.

Summary of Results

Results of the analysis of the data indicate that SCF are quite effective as evaluator tools and can reduce instructional time by as much as two-thirds. The SCF appear to have little effect on the total time students spend on the job sample and the black and white-no-sound film treatment groups required the greatest number of repeated instructions.

However, because the number of times instructions needed to be repeated averaged well under one time per student, the use of standard instructions based on job sample analyses could have had an effect on this variable.

Noninstructional time was operationally defined for this study as time the evaluator spent with the student in a loosely structured interview after the job sample had been completed. Generally, more noninstructional time was spent with students when they had used the no-sound films and, on the second job sample, when they were given the verbal-without-film instructions. However, the instructional time saved by using SCF could, at the option of the evaluator, be used as noninstructional time to enhance the evaluator-student interpersonal relationship.

Color-sound was judged to be the most effective film treatment and the no-sound films the least effective for both the total number of film runs required to complete the job sample and the final engraving plate quality. The mean differences were relatively small in all cases, however, and the overall study findings indicate that filmed instructions are just as effective as completely verbal methods for presenting job sample instructions. This, plus the time saving feature of SCF make them very attractive for use as evaluator tools in assessing the training and work potential of handicapped students.

Suggestions for Future Research

Very few studies have been done on the use of SCF with handicapped students. Additional research is needed in order to expand upon the findings of this study and other studies related to determining the effectiveness of SCF as instructional tools. The topics listed below are suggested for additional study.

1. A determination of the effects of various evaluator characteristics on relevant SCF variables; particularly the effects various characteristics have on the amount of noninstructional time spent with students.

2. A comparison of the effects of the presentation of all verbal instructions by standardized procedures based on job sample analyses, by SCF procedures, and by individual evaluator (non-standardized) procedures.

3. A comparison of the effectiveness of professionally made SCF on job samples used in rehabilitation facilities, "home made" SCF, and appropriate SCF which may be available commercially.

4. A comparison of the effectiveness of the four types of SCF on a wide variety of job samples used in rehabilitation facilities.

5. A determination of the effectiveness of SCF in the actual training process at rehabilitation facilities and in special

education programs for handicapped students in conventional educational settings.

Conclusions

The study results clearly indicate that SCF can be effective tools for evaluators in presenting job sample instructions to handicapped students. The findings suggest that the evaluator who uses SCF will probably have more time in which to try to meet the individual needs of all his students. There would seem to be no reason why these same benefits could not accrue to rehabilitation facility instructors who are engaged in teaching handicapped students marketable skills.

Some additional potential uses for SCF at rehabilitation facilities are suggested as follows:

1. Orientation programs for new students at rehabilitation facilities might be effectively supplemented by SCF.

2. Films dealing with some of the activities of daily living could be very helpful. The newly disabled might especially benefit from these types of SCF because of the various adjustments many impairments require.

3. The SCF of job samples could be used by new evaluators to help them become familiar with the types of samples used and the skills these samples are designed to assess. The orientation SCF mentioned above might be very helpful to all new employees.

4. Using SCF might provide a convenient method by which various types of job sample ideas could be exchanged from one rehabilitation facility to another. Film cartridges could easily be exchanged by mail.

The suggestions presented above are but a few of the potential uses of SCF at rehabilitation facilities. Many others will probably become apparent as films of this type become more widely used.

In ever increasing numbers public schools are beginning to assume responsibilities for the education of handicapped students. Special education classes are being established to accommodate deaf, mentally retarded and other types of handicapped students. Many new schools are being designed and built incorporating ramps, elevators, and other special features so as to allow the handicapped to participate in their programs. Because of this trend the need for innovations to satisfy the special needs of these students will continue to grow. The development of SCF to meet some of the special needs of these students represents such an innovation. Many of the uses similar to the ones described above for students involved in rehabilitation facility programs are probably appropriate for students in special education programs in the public schools. The nonhandicapped student should also benefit from the use of this unique instructional tool.

It is postulated that SCF might well prove to be valuable aids, not only in evaluation of potential, but in the actual training process and in the mastery of difficult concepts in academic subjects as well. Much additional research is needed in this area.

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APPENDIX A - EVALUATOR INSTRUCTIONS

General Instructions For All Experimental Procedures

It is extremely important that evaluators who are collecting data for this study read all instructions and directions carefully so that each presentation will be made in the same way for every student in the study.

The following general instructions will apply to all treatments:

1. Ask every student whether or not he has ever worked on the engraving machine or any like it. If he has, do not use him as a subject in the experiment.
2. The first operation that the evaluator performs should be to begin filling out the data collection sheet. Specifically, the evaluator's name, the date, the student's name (written legibly), the student's I.D. number, student's status (evaluation or training), and the experimental treatment--all of these items should be filled in.
3. The evaluator should then go through the check list provided prior to calling the student into the work area.
4. The task start time should be recorded when the student is brought into the work area.
5. When the evaluator actually starts verbal instructions, timing of instructional time should begin.
6. Try to answer all questions using the same words, as closely as possible, as the words used in the directions given.
7. Note the number of times you repeat distinct, separate pieces of information as are given in the directions and record this number on the data collection sheet.
8. If the student asks questions or makes comments concerning topics such as general vocational information or any type

question or comment which does not relate to task performance, tell him that these things will be discussed after the task has been completed.

9. Each time you instruct the student while he is working on the task, measure the length of your stay with him on your stop watch and record the time in the appropriate space on the sheet. Also, as pointed out above, don't forget to record the number of times you repeat instructions.

10. If the student has not completed the task within one hour, in a kind way, dismiss him from the testing area and note on the data collection sheet why, in your opinion, the student could not complete the task.

11. On the machine engraving #2 task, be sure to record the number of plates used by the student and also rate the quality of task performance based on the following criteria: (A) Poor - plate badly off center and/or scratches on four or more letters. (B) Fair - plate slightly off center and/or scratches on two or three letters. (C) Good - plate centered and scratches on only one letter. (D) Excellent - plate centered and no scratches.

12. Criteria for successful completion of both tasks are as follows: (A) Machine Engraving # 1 - the word "ENGRAVE" must be spelled correctly, all letters must be in the slide grooves correctly and the letters must be centered in the slide. (B) Machine Engraving #2 - All seven letters must be engraved and at least four of the seven letters must be without scratches. The plate must be removed from the work holder.

Instructions for Short Concept Film Presentation

Machine Engraving #1 - No Film

(Before bringing the student in to begin the task, do the following things:

1. Make sure that the letter tray and cleaning brush are in place in the storage cabinet.
2. Be sure that the machine adjustments and calibrations have not been moved and that the styli are in the back position.
3. See that the letter clamps are always in the center of the alphabet slide and the set screws on them are snug.

(When you have completed the above, note the beginning time on the data collection form, bring the student in, seat him, and begin timing your instructional time.)

Evaluator: We are always trying to find better ways to work with students. We want you to participate in this interesting study to find out the best way to teach the use of this engraving machine. We don't want you to rush but we would like to see how rapidly you can finish the different tasks you are going to be shown. O.K.? (Pause long enough for student to ask any questions about what is expected of him in the experiment.) I'm going to help you to learn to make a plate like this one (show plate with word E-N-G-R-A-V-E on it) on this machine. I want to explain how we set the machine up for engraving all the way through before you ask any questions. After I have gone through my instructions once, you can ask all the questions you like and I will repeat the parts you might not understand as many times as you like, but let me go all the way through first. I'll tell you when you can ask questions--O.K.? This machine is used by people who work in jewelry stores and it is called an engraving machine. Now before you

actually start to use the machine, I want to tell you what some of the different parts are and what they are used for. This is the storage cabinet (point to cabinet) and this is the work space (point to the work space). This is called the work holder (point to work holder) and it holds the plate (show plate) in place while it is being engraved. This is the alphabet slide (point to alphabet slide) and it is called this because we put the letters we want to engrave on here. These are the letter clamps (point to letter clamps). They hold the letters on the alphabet slide in place. Now I don't expect you to remember all of these names right now, but you will get to know them as you use the machine.

Now, the first thing we do is to remove the tray of engraving letters from storage (as you say this, do it) and place it on the work space to the right of the machine. Remove the cover and put it back in the storage cabinet (do this). Notice that the letters (point to the letters) are in alphabetical order, from left to right.

We must keep the machine clean if we are going to do good work, so before starting any job, remove the cleaning brush from the storage cabinet (do this) and brush the machine off, particularly the work holder and the alphabet slide (brush these parts off and then replace the cleaning brush). Now loosen the set screws on the letter clamps until they slide easily (do this). Move the left clamp to the left edge of the alphabet slide and leave it there (do this). Remove the right clamp from the slide and put it on the work space (do this).

Today you will engrave the word "ENGRAVE", spelled E-N-G-R-A-V-E just like you see on this plate (show engraved plate). Now to do this, select the letters one at a time, just the way you would spell the word (pick up the letter "E") and beginning at the right hand side of the alphabet slide, slide the letter in (slide "E" over to left letter clamp). Notice that the letters (pick up "N" and show edges) have beveled edges at the top and bottom. The edges must be fitted into the grooves of the slide (do this) so that they will stay in place

while you are engraving. We put all the letters on the slide G-R-A-V-E (do this).

Now look at the letter clamp (point to left letter clamp). Notice that it has a pointer at the top (point to pointer). Now notice that there is a number line at the top of the alphabet slide and that the pointer points to these numbers. We use these numbers to center the letters in the slide. First of all, pick up the right hand letter clamp and replace it in the slide (do this). Move it over so that it touches the letters (do this). Now hold both clamps snugly against the letters and center the group on the "0" in the center of the number line (point to "0"). Notice that you can tell when the letters are centered because both pointers are on the same number. You see, the left pointer is almost on the number 13 (point) and so is the right pointer (point). When the letters are centered, tighten the set screw on each letter clamp firmly (do this).

Before you actually start to do the engraving, I want you to feel sure that you can get the machine set up, just like I have set it up. So, I'm going to put everything back the way it was and I want you to try to do just what I have done. Now, ask all the questions you like and I will answer all of them before you begin.

(As you are saying the last paragraph above, put all materials back as they were originally so that student can begin from scratch. Answer all questions on this phase of the operation--DO NOT let student get ahead of you, keep him on this phase of the operation.

(When all task performance questions have been answered and the student is ready to try the task on his own, stop your watch, leave the student, and record the time spent in giving instructions on data collection sheet.

(When the student has completed the task successfully, that is, when the letters of the word "ENGRAVE" are correctly inserted and centered on the alphabet

slide and spelled correctly, move the student back from the machine, sit down with him and measure the non-instructional time spent in a free discussion of the following questions.)

Evaluator: Do you have any questions about using this machine?

(Allow full and free expression and make appropriate responses. During this period, the evaluator should elicit discussion from the student as much as possible. Specific points that should be covered by working them into the conversation as naturally as possible are as follows:

1. Did you have any problems or trouble in putting the letters in the alphabet slide? (If "yes", inquire as to the nature of the problem.)
2. Did you have any problems or trouble in centering the letters on the slide? (If "yes", inquire as to the nature of the problem.)
3. How do you feel about the things that we have done so far this morning?

(After discussion has been completed, excuse the student, record the total non-instructional time and the total time on the task. Make sure data collection sheet is filled out completely.)

Instructions for Short Concept Film Presentation

Machine Engraving #1-Using Film

(Before the student is called in to begin work, do the following things:

1. Make sure you have the correct film for the particular treatment of the week.
2. Insert the film into the projector.
3. Turn projector on and be sure film is focused and properly framed. If sound film, make sure sound is at the appropriate level. Run

film all the way through.

4. Fill in all appropriate spaces on data collection form.
5. Make sure engraving letters and cleaning brush are in the storage cabinet. Make sure letter clamps are in the center of the alphabet slide and the styli are in the back position.

(When you have completed the above, note the beginning time on the data collection form, bring the student in, seat him, and begin timing your instructional time.)

Evaluator: We are always trying to find better ways to work with students. We want you to participate in this interesting study to find out the best way to teach the use of this engraving machine. We don't want you to rush but we would like to see how rapidly you can finish the different tasks you are going to be shown. O.K.? (Pause long enough for student to ask any questions about what is expected of him in the experiment.) You are going to use this movie projector (point to projector) to help you to learn how to use this machine (point to engraving machine). This machine is used by people who work in jewelry stores to do engraving.

It's real easy to use this projector, all you have to do is push this lever down (point to lever) to start it. The projector will turn off by itself when the film is over. When the film ends you will hear a kind of thump because this lever (point to lever) jumps back into the up position. To look at the film again, all you have to do is push the lever down again. Now I have to ask you please not to touch any of the other buttons or knobs on the projector. Please don't touch this knob (point to volume knob) or this button (point to off button), or these knobs (point to focusing and framing knobs). All you have to do is push this lever down (point to lever) to start the projector. Just call me if you have any trouble with it.

Now I want you to watch the film as many times as you like and then try to do just what the film shows you on this machine (point to engraving machine). When you are ready to start work on the machine, call me if you have any questions whatsoever. If you get stuck or are having problems with any part of what you are doing, watch the film again. If you feel that you need me for any reason, just call me. Do you have any questions?

(Answer any questions that the student has with regard to the projector. DO NOT let the student get ahead and begin a discussion concerning the engraving machine. After all questions have been answered, walk away from the student and record the instructional time.

(During the student's performance of the task, if he has questions which you feel are not answered on the film, provide the answers and record your instructional time. The task is completed when the word "ENGRAVE" is centered in the alphabet slide. Record the ending projector meter reading, and total number of film runs.

(When the student has completed the task successfully, that is, when the letters of the word "ENGRAVE" are correctly inserted and centered on the alphabet slide and spelled correctly, move the student back from the machine, sit down with him and measure the non-instructional time spent in a free discussion of the following questions.)

Evaluator: Do you have any questions about using this machine?

(Allow full and free expression and make appropriate responses. During this period, the evaluator should elicit discussion from the student as much as possible. Specific points that should be covered by working them into the conversation as naturally as possible are as follows:

1. Did you have any problems or trouble in putting the letters in the alphabet slide? (If "yes", inquire as to the nature of the problem.)
2. Did you have any problems or trouble in centering the letters on the slide? (If "yes," inquire as to the nature of the problem.)
3. How do you feel about the things that we have done so far this morning?

(After discussion has been completed, excuse the student, record the total non-instructional time and the total time on the task. Make sure data collection sheet is filled out completely.)

Instructions for Short Concept Film Presentation

Machine Engraving #2 - No Film

(The student must have completed Machine Engraving #1 before beginning this task.

(Before bringing the student in to begin the task, do the following things:

1. Make sure that the blank plates (with tape peeled off) and small ruler are in the storage cabinet.
2. Make sure the letters are centered in the alphabet slide and the styli are in the back position.
3. Be sure that the machine adjustments and calibrations have not been moved and be sure the work holder is adjusted to accept the plate.

(When you have completed the above, note the beginning time on the data collection form, bring the student in, seat him, and begin timing your instructional time.)

Evaluator: Now that you have centered all of the letters on the alphabet slide, I'm going to show you how to do the actual engraving. Now just as we did before, I want you to hold your questions until I have gone through the complete procedure one time. After I've gone all the way through the

instructions once, you can ask all the questions you like and I will repeat the parts you might not understand as many times as you like. But, wait until I tell you before you start to ask questions. O.K.?

The first thing we do is to get a plate from the storage cabinet (do this). We are going to do the actual engraving on this plate. Place the engraving plate in the work holder (do this).

Now we are going to center the plate in the work holder. We do this using this small ruler (get ruler from storage cabinet). Hold the plate down and measure the amount of over hang on each side of the work holder (do this). When you have the same amount of over hang on each side of the work holder, the plate is centered. When you are sure that the plate is centered, hold it down firmly (do this) and turn the work holder tightner knob until the plate is held in place and will not move.

Now take the small blue knob with your right hand and swing the stylus into place over the letters (do this). To begin engraving, place the tip of the tracing stylus into the groove of the first letter "E" (do this). Then, with the palm of your left hand, push down the big red knob so that the cutting stylus is on the plate. You don't have to push down too hard. Now trace the letter "E" by moving the stylus tip in the grooves (do this). To make sure that you get a good cut, move the tip all around the groove twice (do this).

Now this is very important, when you have cut the letter "E", be sure to turn loose of the big knob (do this) before you take the tip of the tracing stylus out of the grooves (take tip of stylus up).

After you have turned loose of the big knob, put the tip of the tracing stylus into the grooves of the next letter (do this), and then press down on the big knob again (do this). Keep a steady, firm pressure on both knobs. Trace the letter (do this).

(Begin on letter "G".) Press down the small knob first, then the big

knob (do this). (As you trace the letter "G") Be very careful that the tip of the tracing stylus does not slip from the letter grooves because if it does the plate will be ruined.

Now you just do this same thing for every letter until they have all been cut (trace the letter "R"). (As you begin on the letter "A") Always remember, push down the small knob first (do this) and then the large one (do this). (After the letter "A" has been traced) After a letter has been traced, always turn loose of the big knob first (do this) and then lift the small knob (do this). (As "V" tracing begins) The small knob is pressed down (do this), then the large one (do this). (After "E" has been traced) When you finish tracing a letter, turn the big knob loose (do this), then lift the small one (do this).

When you finish the word, move the stylus to the back position using your right hand holding the small knob (do this).

Now loosen the work holder tightener knob and take the plate out of the work holder (do this). When you do this I want you to trace all seven letters on the plate just like I did before you take the plate out of the holder.

Now, ask all of the questions you like and I will answer all of them before you begin.

(Answer all questions on this phase of the operation and be sure the student stays on this phase only. When all task performance questions have been answered and the student is ready to try the task on his own, stop your watch, leave the student, and record the time spent giving instructions on the data collection sheet.

When the student has completed the task successfully, that is, when he has engraved four of the seven letters without scratches and removed the plate from the work holder, move the student back from the machine, sit down with him and measure the non-instructional time spent in a free discussion of the following questions.)

Evaluator: Do you have any questions about using this machine?

(Allow full and free expression and make appropriate responses. During this period, the evaluator should elicit discussion from the student as much as possible. Specific points that should be covered by working them into the conversation as naturally as possible are as follows:

1. Did you have any problems or trouble centering the plate in the work holder? (If "yes", inquire as to the nature of the problem.)
2. Did you have any problems or trouble doing the engraving? (If "yes", inquire as to the nature of the problem.)
3. How do you feel about the things that we have done so far this morning?

(After discussion has been completed, excuse the student, record the total non-instructional time and the total time on the task. Make sure data collection sheet is filled out completely.)

Instructions for Short Concept Film Presentation

Machine Engraving #2 Using Film

(The student must have completed Machine Engraving #1 before beginning this task.

(Before the student is called in to begin work, do the following things:

1. Make sure you have the correct film for the particular treatment of the week.
2. Insert the film into the projector
3. Turn projector on and be sure film is focused and properly framed. If sound film, make sure sound is at the appropriate level. Run film all the way through.

2

4. Fill in all appropriate spaces on data collection form.
5. Make sure that the blank plates (with tape removed) and small ruler are in the storage cabinet, the letters are centered in the alphabet slide and the styli are in the back position.
6. Be sure that the machine adjustment and calibrations have not been moved and be sure the work holder is adjusted to accept the plate.

(When you have completed the above, note the beginning time on the data collection form, bring the student in, seat him, and begin timing your instructional time.)

Evaluator: Now that you have centered all of the letters in the alphabet slide, I have set up another film which will help you to learn how to do the actual engraving.

The film tells you to use an engraving plate and a ruler and here they are in the storage cabinet (point to plates and ruler).

Remember now, all you have to do is push this lever down to start the projector. The projector will turn off by itself when the film is over. Then to start the film again, just push down the lever again. Please remember not to touch any of the other knobs or buttons.

Now I want you to watch the film as many times as you like and then try to do just what the film shows you on this machine (point to engraving machine). When you are ready to start work on the machine, call me if you have any question whatsoever. If you get stuck or are having problems with any part of what you are doing, watch the film again. If you feel that you need me for any reason, just call me. Do you have any questions?

(Answer any questions that the student has with regard to this phase of the task. After all questions have been answered, walk away from the student and record the instructional time.

(During the student's performance of the task, if he has questions which you feel are not answered on the film, provide the answers and record your instructional time. The task is completed when the student has engraved four of the seven letters without scratches and the plate has been removed from the work holder. When the student has finished, move him back from the machine, sit down with him and measure the non-instructional time spent in a free discussion of the following questions.)

Evaluator: Do you have any questions about using this machine?

(Allow full and free expression and make appropriate responses. During this period, the evaluator should elicit discussion from the student as much as possible. Specific points that should be covered by working them into the conversation as naturally as possible are as follows:

1. Did you have any problems or trouble centering the plate in the work holder? (If "yes", inquire as to the nature of the problem.)
2. Did you have any problems or trouble doing the engraving? (If "yes", inquire as to the nature of the problem.)
3. How do you feel about the things that we have done so far today?

(After discussion has been completed, excuse the student, record the total non-instructional time and the total time on the task. Make sure data collection sheet is filled out completely.)

APPENDIX B - DATA COLLECTION FORM
for
SHORT CONCEPT FILMS STUDY

Evaluator: _____ Student in Evaluation ☐

Date: _____ Training ☐

Student Name: _____ I.D. Number: _____

Experimental Treatment (check one)

Mach. Eng. #1 ☐ Mach. Eng. #2 ☐ Stencil Mach. ☐

☐ 1. Color film with sound.

☐ 2. Color film without sound.

☐ 3. Black and white film with sound.

☐ 4. Black and white film without sound.

☐ 5. Standard evaluation procedure.

Ending Meter Reading _____

Beginning Meter Reading _____

Total Number of Runs _____

Total time on task: Started _____ Ended _____

Total minutes on task: _____

record
instructional time

Instructional time on task in minutes _____

Number of times instructions repeated: _____

record
non-instructional time

Non-instructional time in minutes: _____

Number of Plates Used: _____

Quality of Final Plate: (check one)

POOR ☐ FAIR ☐ GOOD ☐ EXCELLENT ☐

APPENDIX C - TREATMENT SCHEDULE

DATE	TREATMENT
January 6 - 10	No Film
January 13 - 17	Black and White - No Sound Film
January 20 - 24	Black and White - Sound Film
January 27 - 31	Color - No Sound Film
February 3 - 7	Color - Sound Film
February 10 - 14	No Film
February 17 - 21	Black and White - No Sound Film
February 24 - 28	Color - No Sound Film
March 3 - 7	Black and White - Sound Film
March 10 - 14	Black and White - Sound Film
March 17 - 21	Color - No Sound Film
March 24 - 28	Black and White - No Sound Film
March 31 - April 4	Color - Sound Film
April 7 - 11	No Film
April 14 - 18	Black and White - No Sound Film
April 28 - May 2	Color - Sound Film
May 5 - 9	No Film
May 12 - 16	Color - No Sound Film
May 19 - 23	Color - Sound Film
May 26 - 30	Black and White - Sound Film
June 2 - 6	Make Up